MULTI MACHINE INSPECTION SYSTEM

The present invention relates to machines,
which inspect bottles for defects and more
particularly to a system, which includes a number of
such machines collectively evaluating a bottle.

BACKGROUND OF THE INVENTION

Machines for inspecting glass bottles conduct a
great variety of inspections including an inspection
for the mold cavity data so that an operator will
know where a defective bottle was made and can
promptly adjust the bottle making process to elimin-
ate the problem at that mold. Conventionally a
single machine can only handle a limited number of
inspections and as a result a number of machines
will sequentially receive the bottle to be inspected
and together all the required inspections will be
completed.

Each machine has its own inspection system and
will determine whether any processed bottle should
be rejected. Often a rejector will be associated
with each machine and the rejector will be
controlled by the inspection system for that
machine. Occasionally, a single rejector will be
connected to the inspection system of all each of
the machines so that multiple rejectors can be
avoided.

OBJECT OF THE INVENTION

It is an object of the present invention to
provide a system for inspecting glass containers

which is defined by a number of machines which uses a single rejector and a much simplified reject process.

Other objects and advantages of the present invention will become apparent from the following portion of this specification and from the accompanying drawings, which illustrate, in accordance with the mandate of the patent statutes, a presently preferred embodiment incorporating the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an elevational schematic view of a system for inspecting bottles; and

Figure 2 is a logic diagram for the processor of the first machine in a multi machine line;

Figure 3 is a logic diagram for the processor of a middle machine in a multi machine line; and

Figure 4 is a logic diagram for the processor of the last machine in a multi machine line.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Figure 1 shows a number of inspection machines M1,M2,Mn which sequentially inspect a bottle 10. The bottle is conveyed through the machines via any number of conveyors 12 which could include belt conveyors which support the bottom of a bottle or devices which have opposed pairs of belts which grip the side wall of a bottle, for example. An encoder 14 is associated with each conveyor so that the position of a bottle can be tracked through the machine. Also present at the entry of each machine

is a part present sensor 16 and a rejector 18 is located following the discharge of a bottle from the last machine.

Each machine has an inspection system 19 which includes a number of inspection stations 20 (more than one inspection could be performed at a single station) and a processor 22 which will identify a specific bottle that should be rejected when one or more of the inspections shows a defective bottle.

As can be seen in Figure 2, the processor in the first machine of a multi-machine line will Identify Bottle "X" 30 (each bottle) as that passes the part present sensor and will Inspect Bottle "X" 31. At the completion of the inspection processes carried out by the first machine, the processor will know whether or not any of the inspections carried out by that machine indicate that the bottle should be rejected. Where the query "Has Bottle "X" Been Rejected By First Machine?" 32 been answered in the affirmative, the processor will Send A Hardwired Bottle "X" Reject Signal To The Next Machine 34.

As can be seen in Figure 3, the processor in a middle machine of a multi-machine line will Identify Bottle "X" 30 (each bottle) as that passes the part present sensor. The processor receives a Hardwired Bottle "X" Reject Signal from The Next Prior Machine and where the query "Has Bottle "X" Rejected Signal From Prior Machine Been Received?" 36 been answered in the affirmative, the processor will Identify Bottle "X" As Bottle Rejected Before Inspection By Machine 38 and will Inspect Bottle "X" 40. Now, if the processor answers the query "Has Bottle "X" Been Rejected In This Machine Or In A Prior Machine?" 42 in the affirmative the processor will Send Hardwired Bottle "X" Reject Signal To The Next Machine 34.

The process will be the same for the last machine of

a multi-line machine except that when the processor answers the query "Has Bottle "X" Been Rejected In This Machine Or In A Prior Machine?" 42 (Figure 4) in the affirmative the processor will Send A

5 Hardwired Bottle "X" Reject Signal To Rejector 44.